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Productivity – measurement and improvement

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Abstract

The objective of this paper is to analyze methods of measurement of labor productivity and introduce them to real business.

The object of this paper is to investigate methods of measuring performance.

The subject of this paper is the process of implementing methods to increase productivity.

Methods (procedures) of the study. Pattern during the writing of this work was used by scientists articles information about the measurement and implementation of systems productivity.

Recommendations for the use of this work. Since this work was written with the use of different methods and examples, not all of them before writing the work was known to me, I want to present a certain part to improve the productivity of some companies in my country.

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1. Introduction

1.1. Background

At the present stage of economic development, one of the main components of successful industrial organizations is planning productivity. Increased productivity reduces the cost of work on the production unit or an increase in output.

This paper describes various approaches to increasing productivity.

Study of the productivity growth is becoming more important against a backdrop of market relations, because it allows company to stay competitive on the market and strengthen the social component in the development of society.

An important role for the analysis of labor productivity is definition and use of reserves to improve production efficiency. It contributes to the economic use of labor resources, identifying and implementing best practices, organization of work, new equipment and technology, to prevent waste, etc.

1.2. Problem area and research question

Productivity is one of the keys to financial success of the enterprise.

At the same time one of the key performance indicators of the enterprise is labor productivity, which characterizes the fraction of output or services produced per unit of labor input, the ratio of the results to the labor costs incurred.

The aim is to analyze staff productivity and enterprise development proposals for planning to increase its productivity.

Achieving this goal requires solving the following tasks:

- Justification of the importance of planning increase productivity of staff;
- Identification, analysis and methods of measuring productivity;
- Determining factors and reserves for increasing productivity;

1.3. Approach

The most appropriate research approach to answer the research question, is the qualitative analysis of the methods by which to measure, analyze, and improve productivity. Among all the methods considered as an increase in overall performance, with the introduction of automation and analyzes how management practices increase productivity.

2. Productivity

2.1. Productivity in general

The group of organizational and economic factors of productivity growth are progressive changes in work organization, production and management. These include: improving the structure of the management and control systems in manufacturing, the widespread introduction and development of automated control systems, improved financial, technical and personnel training of production, improvement of production and ancillary units, improve the distribution and labor cooperation, expansion of combining jobs and functions introduction of advanced methods and techniques work to improve organization and service jobs, the introduction of progressive standards and norms of labor, improving working conditions and rest, improve systems of financial incentives.

There are two components which can increase output: first, the growth of increasing in production input and the growth of increasing productivity.

The relation between output and input is unchanged because characteristic of the growth is by an input increase. Increasing in output means some moving of the production function at the same time with a change in the output or input relation. the increasing in productivity is generated the productivity growth corresponding to a change of the production function. (Saari, S. 2006)

Costs are determined by the amount (value) used economic resources. As you know, economic resources commonly divided into three groups:

- 1) Labor (labor potential, human capital),
- 2) Components of natural resources (land and raw materials),
- 3) Components of production (physical capital).

According separately determined by the efficiency of labor, natural resources or capital.

The results are characterized by volume and value of manufactured and sold products, the size of value added, income indicators of competitiveness, quality of life and ecology. Most results are expressed in terms of production or profit. If the calculation results are determined by the efficiency of production volume, we obtain the figures, called capacity, and if the profit, the following performance metrics are called profitability (Vihurzhynska S. 2003).

Productivity is a fundamental concept in economic analysis. The evolution of mid-to-long-run economic growth — which is a crucial assumption of analyses, on fiscal sustainability, for instance — relies substantially on perspectives on productivity growth. Productivity is also important in the light of short-run economic dynamics. For example, when an economy grows, the desirable policy accompanied by a rise in productivity will be totally different from that without the rise. Considering monetary policy, immediate monetary policy tightening is not necessary if an economy grows with a rise in productivity and labor market conditions are not tight. By contrast, central banks should be cautious about economic growth without rising productivity, because economic bubbles and accelerated inflation are fairly likely to happen through economic overheating. While it is widely recognized that productivity is conceptually important, measuring productivity is quite difficult. One challenge in measuring productivity is that productivity measured in real time will be revised due to revisions to its source data. (Naoko Hara, Hibiki Ichiue, 2011)

2.2. Production function

Increasing productivity is characterized by a change of the production function and a consequent change to the output relation and input relation. The formula of total productivity is normally written as follows:

$$\text{Total productivity} = \text{Output quantity} / \text{Input quantity} \quad (1)$$

This formula showed, which changes in input and output must to be measured inclusive of both quantitative changes and qualitative changes. (Jorgenson, D. W. & Griliches, Z. 1967)

There are many quantitative and qualitative changes which take place when relative and quantities prices of different output and input factors alter. If you want to accentuate qualitative changes in input and output, the formula of total productivity represented as follows:

Total productivity = Output quantity and quality / Input quantity and quality.

(Saari, S. 2006)

2.3. Measures of productivity and their uses

Measurement of productivity is it a ratio between input and output.

In general, measure of productivity can be divided into multi-factor productivity measures and single-factor productivity measures.

One more distinction is between measures of productivity that apply gross output to one or several inputs and those that use a value-added concept to capture output movements (Table 2.1).

The measurement in Table 2.1 can be used to calculate rates growth of productivity and also to the calculation levels of productivity.

Table 2.1 Overview of the main productivity measures

Type of output measures	Type of input measures			
	Labor	Capital	Capital and Labor	Capital, labor and intermediate inputs (energy, material, services)
Gross output	Labor productivity (based on gross output)	Capital productivity (based on gross output)	Capital – Labor MFP (based on gross output)	KLEMS multi-factor productivity
Value-added	Labor productivity (based on value-added)	Capital productivity (based on value-added)	Capital – Labor MFP (based on value added)	-
	Single factor productivity measures		Multi-factor productivity (MFP) measures	

Source: OECD Productivity Manual (OECD, 2001a)

Different levels of productivity require different ratios of output and ratios of inputs between two or more countries. One of the common simplest way to get output ratios is to compare physical output measures, such as volume, weight, area. For example, when a laborer in country X produces 100 tons of product per year on average compared to 200 tons per laborer in country Y, ‘physical labor productivity’ in country X is half that of country Y. Now the using of physical units of output for measure of productivity is mostly restricted to benchmarking the efficiency of a particular production process for a special product or for the same group of products over time. Comparing productivity at firm or industry level and the heterogeneity of output and the large diversity of products makes the using of physical units insignificantly. It is often so hard to pick out inputs to just one output. In services, the using of physical units is often so impossible.

In real life, one is more likely to get only access to figures on the total values rather than quantities of inputs and outputs. If compare levels of productivity

across space, measuring of value must to be corrected for differences in relative prices. This revision can be made by using purchasing power parities (PPPs), which can specify the ratio of the price for a service or good. (Bart van Ark and Marcel Timmer, 2006).

2.3.1 Measuring and interpreting partial productivity

Measuring of partial productivity concerns to the measuring solutions which do not meet the requirements of measuring of total productivity, yet, if you be practicable as indicators of total productivity. So often in practice, measurement in business means measures of partial productivity. In this case, the purpose of measurement are components of total productivity, and interpreted correctly of these components are indicative of productivity development. The period of partial productivity illustrates the fact that total productivity is only measured approximately or partially quite good. Sometimes, measurement of defective which by understanding the logic of total productivity, it is right to report the correctly results of partial productivity and about benefit from them in practical cases. The 5 typical solutions of partial productivity are:

1. Single-factor productivity
2. Value-added productivity
3. Unit cost accounting
4. Efficiency ratios
5. Managerial control of ratio system

Single-factor productivity relates to the measuring of productivity that is one input factor and a ratio of output. Single-factor productivity relates to the measuring of productivity that is one input factor and a ratio of output. A most famous measuring of single-factor productivity is the measuring of output per work input which describes work productivity. Actually, it is practical to use the value

added as output. That's why, measuring of productivity in this case is called Value-added productivity. Also, productivity may be examined in cost accounting using unit costs. After that, this is mostly a reason of exploiting data from standard cost accounting for measurements of productivity. Efficiency ratios tells something about the ratio between the sacrifices and the value produced made for it, are available in big numbers. Managerial control ratio systems are included single measures which are interpreted the same with other measures related to the subject. Ratios can be connected to any factors of success of the area of responsibility, such as quality, profitability, position on the market. Ratios can be combined to form one whole using simple hence, rules, creating a key figure system. (Saari, S. (2006)

The partial productivity measures are nominal price value measures, physical measures and fixed price value measures. These measures different between from each other by the variables excluded from measurements and by the variables they measure. By excluding measurement variables makes it possible to focusing on the measurement on a given variable, but it is means a more tight approach. (Saari, S. 2006)

2.4. The new productivity paradigm

Economic theory doesn't mean much to inform management about increasing productivity. According micro-economic theory, productivity is defined by the mix of labor and capital employed. These are the only factors how you can recognize production, and the sole role for management is to define the allocation of labor and capital. For increasing productivity it must allocate more capital (e.g., equipment, tools, etc.) to a fixed quantity of labor.

Dramatic productivity improvements resulted from management developing as a profession and employing the tools of Scientific Management as well as new technology such as the wide application of electric power and many forms of new machinery to production activities. As mass production spread among the industrialized countries, the volume and variety of goods available increased and

the era of mass consumption began. The only way to further raise productivity was to increase automation, and, with the advent of computers and information technology, apply more IT as well. This approach completely overlooked the contribution that managers could make by improving processes and work methods, which in many firms where automation is difficult (e.g. many services) is the only practical method to increase productivity. The contribution of automation to productivity improvement, in particular the application of IT, is not to be important, but it is not the only way to increase productivity. Lean production and TQM/Six Sigma provide an alternative model. This New Productivity Paradigm model of modern production systems will be explained in this section (Robert N. Mefford, 2009). Modern production theory has developed on two fairly independent paths, the productivity track and the quality track. Firms pursued one or the other paths, but rarely both, likely as a result of the common view that quality and productivity were tradeoffs.

Many had success with the path chosen. However, the synergies between lean production and quality improvement began to become apparent as firms found that, by pursuing quality improvement programs, they also experienced improvements in productivity and vice versa (Breyfogle et al., 2001). The fundamental reason for this is the focus in both approaches on process improvement. Lean production and TQM/Six Sigma tried to improve processes or them (lean production) or to reduce defects (TQM/Six Sigma). But one of the major causes of inefficiency is defects (rework and scrap), and one of the major reasons for defects is a poorly coordinated and structured process. Managers began to realize that process improvement was the key to improving both quality and improvement, and thus their inherent complementarity was recognized.

The synergy between productivity and quality improvement is in stark contrast to the traditional production model where they are seen as tradeoffs. The tradeoff view says that firms must establish a competitive priority in terms of cost, quality, delivery, or flexibility and focus on that priority (Skinner,1969). If a

manager wanted to improve quality, he/she had to slow down the work, do more inspection, hire more skilled workers, do more training, or use more expensive materials, all of which increased cost. (Robert N. Mefford, 2009)

The New Productivity Paradigm (NPP) is designed to yield better results in terms of productivity as well as quality improvement compared to the traditional production approach. It also yields benefits in terms of being more flexible and having shorter lead times, major advantages in a highly competitive global marketplace.

Many firms have tried the tools of quality and productivity improvement (e.g. Quality Circles, control charts, etc.) but with limited success in their organizations. They have observed how these tools work but do not understand why they work and thus are unable to construct a coherent system for improvement. (Inkpen, 2005).

The firms that achieve dramatic improvements in quality and productivity are those that take a systems approach and make the necessary culture change in the organization. This is usually driven by a management that initiates and supports this change.

2.5. Methods of increasing productivity

The New Productivity Paradigm suggests methods that are effective in improving productivity in a firm. Both the Six Sigma quality programs and lean production systems have a structured approach with toolkits that have been successfully used by many firms. In this section, these will be explained along with some other practical ways to improve productivity and quality in the global firm.

2.5.1. Quality improvement programs

Six Sigma quality programs are derived from the statistical quality control methods first developed by Walter Shewhart (1931) in the 1930s at Western Electric Company and popularized by W. Edwards Deming (1982), Joseph Juran

(1979), Philip Crosby (1979), and others in the following decades. These methods developed in the U.S. but first were applied in Japan. They got using in the U.S. just after American firms faced intense competition from Japanese firms.

Table 2.2 Traditional versus the New Productivity Paradigm (NPP) on key dimensions.

Dimension	Traditional	New Productivity Paradigm
Responsibility for productivity	Engineers/managers	Workers
Productivity goals	Short-term	Long term
Manager's role	Boss	Coach
Employee's role	Work harder	Work smarter
Staff role	Control	Support
View of employee	Cost	Asset
Way to improve productivity	Automation and cost-cutting	Process improvement
Methods	Time-and-motion study/trial and error	Structured/scientific method
Time-path of improvement	Intermittent/Big Bang	Continuous/kaizen
Cost–quality relation	Trade-off	Complementary
Supply chain	Arms-length	Partnership
Metrics	Financial	Customer and quality-focused

2.5.2. Lean production methods

The lean production approach offers a different but complementary way to improve productivity and quality. The emphasis in lean production on elimination of waste and continuous improvement combined with a strategic focus on quality by the company (Stewart and Raman, 2007).

Lean production systems have a different set of methods for improving productivity and quality than TQM and Six Sigma, although some of tools may be jointly utilized. In lean systems, the emphasis is on reducing waste (muda) of all types: space, time, energy, motion, materials, inventories, and defects. To getting this goal, employees were training to use the scientific method to check this hypothesis. (Spear and Bowen, 1999). They are taught to always look for sources of muda and develop experiments to find ways of eliminating it. Teamwork is emphasized to leverage the efforts of a work team that typically rotates jobs and knows the process intimately. Managers serve as mentors and coaches in these efforts which are considered a part of every employee's job responsibilities. Employees primarily learn the continuous improvement process based on the scientific method through a “learning-by-doing” approach.

2.5.3. Supply chain management

In an increasingly effective supply chain management, globalized economy are a prerequisite to global competitiveness. Most firms have at least some international sourcing or production and sales. These global supply chains must be managed well for the firm to maximize its productivity gains and add to its competitiveness. Many firms do very little actual manufacturing these days having outsourced their production to third-party subcontractors, usually in developing countries. Yet their brand name is on the product, and their brand equity will be largely determined by the performance of their subcontractors. They need to work with these subcontractors as well as logistics providers to assure high quality, low costs, and quick delivery. There are increasing concerns about Corporate Social

Responsibility (CSR) that also must be factored in; these involve working conditions in overseas plants and environmental issues. If the CSR concerns are not properly addressed, the firm's brand image and sales may suffer (Auger et al., 2003).

The key to effective supply chain management is viewing it as an integrated process where, if any partner improves everyone else in the supply chain benefits (Hammer, 2001). Increased sales due to lower costs, better product design, and better quality in the downstream partners feed back in terms of greater sales and profits for the upstream partners. Lower costs and higher productivity in the upstream partners yield increased sales for the downstream creating a virtuous cycle. To achieve this, the supply chain partners need to work together to coordinate their production schedules and shipments. They also need to cooperate on product design to maximize the comparative advantage of each partner. Most importantly, they need to share expertise and assist each other in improving their internal quality and productivity (Liker and Choi, 2004).

2.5.4. Automation and information technology

The role of information and automation technology (IT) in productivity improvement were frequently discussed. Conventional wisdom is that the pickup in productivity growth in the U.S. in the 1990s and, continuing to the present is due primarily to the widespread application of computers and information technology (Jorgenson and Stiroh, 2000; Oliner and Sichel, 2002). The correlation has been noted, but the linkage between productivity growth and IT appears to be more complex. It has been observed that some of the industries that invested heavily in IT experienced little productivity improvement. One explanation for this paradox is the role of “intangible capital” in the use of IT. If a firm invests in computers and information technology without also changing their internal processes to effectively use it, little productivity improvement is forthcoming. Investing in new business systems, reorganizing the workplace, and worker training are all investments in intangible capital that can pay large productivity dividends which

IT can enable (Baily, 2004). A McKinsey Global Institute report, based on a series of case studies, suggests that it is innovation that really drives productivity growth and innovation is stimulated by competition (Nevins, 2002) and entrepreneurial activity (Baumol et al., 2007). IT plays only a supporting role in this view. Information technology has the potential to improve productivity in a global firm if it is supportive of improvements in business processes. The growth of global supply chains offers one of the most important applications of IT (Mefford, 2006).

One example could be the introduction of automatic 3R systems. System 3R's automation concept gives:

- Increased utilization of existing machine;
- Increased productivity;
- Increased flexibility;
- Lower production costs;
- Lower until costs;
- Shorter depreciation time.

The barriers to integrating a global supply chain is difficulty communicating across cultures and time zones. The development of modern communication and information technology has greatly facilitated this effort and made tightly integrated global supply chains feasible, whereas only a few years ago they were not. Telecommunications technology including satellite, and cellular have made global voice communication cheaper and much more available. The Internet has made possible real time linkage of production and logistics in global firms as well as an enhanced ability to scout out potential suppliers and customers. Improved software such as ERP, SCM, and CRM allow companies around the world to integrate their purchasing, production scheduling, inventory, logistics, and product design functions. Technologies including barcode scanning have also contributed to tracking the movement of materials in a supply chain. The use of IT also can contribute to another method to improve productivity — the professional development of the workforce which will be considered next.

2.5.5. Professional development of the workforce

Driven by the requirements of lean production and the quality programs, firms have been able to significantly improve productivity by upgrading the skills of their workforce. This may occur due to more selective hiring, but often is created internally by more extensive training, job rotation, multitasking, and empowerment of employees. The model of a worker performing a simple, repetitive task over and over has been replaced by one that has a factory worker rotating jobs in a team and participating in kaizen activities. This improves employee morale in general and can yield substantive benefits in terms of highest quality and workers suggestions for improvements in the process. As the employee understands a larger portion of the production process, he or she is more able to contribute to improvement efforts which in itself may be motivating. The higher morale and resultant reduced labor turnover create an incentive for firms to continue to invest in training for workers, which makes them more successful (and often more better) creating another virtuous cycle that fosters long term productivity increases. In addition the training and professional development of jobs may make the application of information technology more productive.

3. Labor productivity

3.1. Measurement of labor productivity.

Labor productivity is component of economic indicators as it offers a dynamic measure of competitiveness, economic growth and living standards within an economy. It is the labor productivity measurement (and all that this measure takes into account) which can help explain the principal economic foundations that are must to be for both social development and economic growth. (Freeman 2008)

Labor productivity is measured by the number of products released by the employee for some time. The inverse value - the complexity - measured by the amount of time spent per unit of output.

People already tried a lot of different ways of increasing labor productivity but most of them were not founded on some knowledge about behavior of human. They tried to use various methods to increase output through bonus presents, payments and pay rises. Most of the attempts failed at the outset or lived so short. Other leaders and managers tried prescribing levels of productivity and combine them with the workforce. It is not surprising, this was not successful. Another unsuccessful groups of leaders and managers tried threats with the almost same result. (Peter L. Mitchell, 2009)

3.1.1. Production function

By increasing of the labor productivity means cost savings of labor (working hours) for the manufacture of a product unit, or an additional amount of output per unit of time, which directly affects the efficiency of production, since in one case, reduced operating costs per unit of output and in another - in a unit time producing more products.

Actual labor productivity (output) is inversely proportional to the complexity is determined directly from the observed data as follows:

$$P_{fact} = \frac{Q_{fact}}{t_{fact}}$$

where Q_{fact} - the actual output in units of this type of product, t - the actual cost of living labor in units of time.

Cash labor productivity is the calculated value, which indicates how many products could be produced in the current environment (for example, on existing equipment from available materials), if all the delays and the delays will be reduced to zero. Cash labor productivity is defined as:

$$P_{cap} = \frac{Q_{cap}}{t_{cap}}$$

where Q_{cap} - the highest attainable in the current output in units of this type of product (cash generation), t_{cap} - the minimum required in the current cost of living labor in units of time (the complexity of cash).

The potential productivity is the estimated value, which indicates how many products can be released to the theoretically achievable in the given environmental conditions at a given level of civilization (for example, from the best available materials on the market by using advanced technology and the installation of the most modern equipment available in the market) if all the delays and the delays will be reduced to zero. The potential productivity is defined as:

$$P_{pot} = \frac{Q_{pot}}{t_{pot}}$$

where Q_{pot} - the highest attainable in the given environmental conditions at a given level of civilization in the output units of this type of output (potential output), t_{pot} - the minimum required data in the environmental conditions at a given level of civilization of human labor costs in units of time (the potential labor input).

Looking at what can make growth of economy in the long run, it is must to be started by examining how is created product. Firms usually use a combination of capital and labor to make their output. Labor includes employees and workers who manage, produce and process production. Capital can be describes both the actual tools and machines used in production and the ideas needed for production. Other intellectual property and are called human capital. Tools and machinery are called physical capital.

Firms can use some different combination of capital and labor to produce output. In some cases, in the production process you can use the labor the capital. One of examples, when production of cars, employees use assembly line and tools to produce a finished product. The workers are the machines and the labor are the capital.

In purposes to increase productivity, each employee must to produce more quantity of output. This is called to as growth of labor productivity. The only way for this to occur is through an in increase in the utilization of capital in the production process. This increase may be in the form of either physical capital and human capital.

An example can help to imagine the basic way that growth of labor productivity works through increases in the capital stock. “Say there is a riveter named Joe. Joe works in a factory that makes metal boxes that are riveted together. He has a riveting tool that can rivet at a rate that allows Joe to finish 4 metal boxes every hour. Joe's labor productivity is thus 4 boxes per hour. One day, Joe gets a second riveting tool. With two tools, Joe can produce 8 metal boxes every hour. Now Joe's labor productivity has increased from 4 boxes per hour to 8 boxes per hour. The increase in the physical capital available to Joe, that is, a second tool, allowed this increase in Joe's labor productivity. For every hour of work Joe puts in, he can produce 100% more output due to an increase in the physical capital available to him.”

Another example also can be using. “Say there is a chef named Susan. Susan can cook 10 hamburgers in an hour. One day, she decides to go to the Hamburger Cooking School to learn how to cook hamburgers faster. When she returns to work, she is able to cook 40 hamburgers per hour by utilizing the new tricks she learned. By attending the cooking school, Susan increased her human capital and thus increased her labor productivity.”

It is so important to know that increases in capital can take the form of both quality and quantity increases. After these two examples, it is clear that the just one way to get labor productivity growth is to increase the amount of physical and/or human, capital, available to workers. And in the end, the just one way for increasing productivity is though increases in the capital used in production. (sparknotes)

In productivity, the most often applied measures are multi-factor productivity and labor productivity. As the last is the distinct effects of labor/capital inputs together with progress of technology, it is often can be as favorable. But due to the lack of proper capital stocks on micro level, it can not be possible to measure total factor productivity. That is why, the second best measure i.e. labor productivity is employed in the study. Labor productivity has advantages: the correlation with other productivity measures is high and the risk of error measurement is reduced. (Lars Fredrik Andersson, 2003)

3.2. Factors That Increase Labor Productivity

3.2.1. Capital Deepening

Capital deepening has a place when businesses invest in more or better equipment, and structures, machinery, all of which make it possible for their workers to produce more. That is why workers with better capital increases the number of products workers produce in each hour they work. Some examples of capital deepening include a faster computer system or the purchase of more

sophisticated machine tools for employees in the manufacturing sector. A business can add capital when it increases its workforce.

Farming provides a classic example of the benefits after using more and better capital. “In 1830, it took a farmer 250 to 300 hours of work to produce 100 bushels of wheat; in 1890, with the help of a horse-drawn machine, the time dropped to between 40 and 50 hours; in 1975, with the use of large tractors and combines, the 100 bushels could be produced in just 3 to 4 hours. While it is most likely that farmers were more educated in 1975 than they were in the 1830s, the change in the farmers skills alone could not be the source of this dramatic efficiency gain; an important source is the use of better capital. Changing from a hoe to the tractor would be categorized as capital deepening, and the resulting increase in output is capital deepening's contribution to productivity growth.”
(jourel.info)

3.2.2. Increases in Skill

Just as a employee who is working with a better machine may produce more goods, a employee who learns a skill needed for production may produce more output in less time. Example, employees who take a class about how to use a computer increases the skill with which they use the computer; the computer is not so faster, but the employees improved their skill and increased output per hour worked and hence, it boosts their productivity. Employees increase their skills with help of additional education, on-the-job experience, training and so on.
(jourel.info)

Performance management of the company or individual units requires a comprehensive approach to improving productivity, for example:

- Creating a system for measuring productivity;
- Determination of reserves of labor productivity growth by growth factors, taking into account the resource potential of the enterprise;
- Develop an plan to increasing productivity;

- Develop incentive schemes for staff to achieve the planned targets;
- Training of employees more efficient ways of working.

3.2.3. Implementation of new system

One of the most important methods of increasing productivity is successful organization operation or implementation of new management personnel. “One of these decisions applied the international company ABB which introduced a system named T50 which was the acronym of the target to reduce delivery times with 50 %. The overall result made it possible to increase the annual revenues from 800 MSEK to 1000 MSEK with a reduction of the number of employees from 650 to 550.” (The CEO for ABB in Sweden, Bert-Olof Svanholm)

One of the objectives of quality improvement in productivity is the ability to apply new technologies to reduce the number of staff so that when it increased productivity. The Swedish branch of the ABB program "Consumers in the focus of attention" was introduced under the name of T-50. "T" (time) meant "time", and 50 - the task of reducing the duration of the operating cycle of 50% to the value created for consumers, increased. Reducing the duration of operating cycle was twice as specific strategic goal of the company, which required the implementation of more stringent quality control activities, as well as closer ties with suppliers.

As part of the T-50 proposed to introduce a system of control set of new indicators, but they lack the systems, the internal logic and orientation of the final result.

Priority objectives of the project included the following T-50.

Development of methods for the analysis of several key aspects or key areas of its activities.

Development of control systems for each unit.

Development of control systems, which would be based on the company's mission and its comprehensive strategy.

The development of forms of presentation of ideas developed by top managers, a wide range of employees.

The development of an information system, repeating the information about the company and its goals to employees.

According to the approach of the company ABB, project was seen as a system of control over operations at the individual level, organizational structure, but in addition, it could be used as a management tool.

Project T-50 suggests that each unit for which the defined strategic goals, develop their own system of monitoring indicators that adequately reflect the situation in various aspects of their activities.

As one of the features of this system was that employees who worked at certain positions for a certain period of time changed the position of their work. it helped them not so tired, do not monotonous work all day, and of course it improves the performance of each employee.

ABB believes that T-50 model serves as a means to illustrate the role of individual units within the overall structure of the company and their development trends in the future.

T-50 is able to simultaneously promote and organize the transition to a more open style of management and decentralization of decision-making. ABB Experience has shown that especially appreciated the advantages of the model, younger employees. ABB managers emphasize that the ideas underlying it, are the main advantage of the model. (<http://jeazy.ru>)

4. Conclusions

Increased productivity is essential for the development of the economy, a particular firm. It enables more effective and efficient use of inputs for each company and get additional income earned by channeling funds for production development, updating the product range.

Reduction in labor productivity leads to inverse results.

The company not only reduces the volume of production, but also loses the necessary funds for production development.

On a separate company working to increase the productivity of labor can be carried out in the following directions:

- Due to the reserves to reduce complexity - namely, the introduction of new technologies, automation and modernization of production, etc.
- From the reserves to improve the use of working time - the organization of labor and production management, improve the structure of the enterprise.
- By improving the structure of the staff - staff training, changes in the relations of production and administrative personnel, etc.

Therefore, for the effective operation of each firm to accurately measure productivity and to take steps to improve it

Labor productivity - a key economic indicator, which characterizes the efficiency of labor in material production as the individual worker and the collective enterprise.

In the manufacture of any product of human labor is involved, labor expended directly to workers in the manufacturing process of the product, and labor of the past, spent by other employees, and embodied in the instruments of

labor, buildings, facilities, raw materials, fuel and energy. Accordingly, the distinction is made between the performance of an individual (living) and social work.

Increased productivity occurs when the proportion of living labor decreases and the proportion of materialized labor increases. This growth occurs in such a way that the total amount of work, consisting in the product is reduced. The fact that the mass of living labor is reduced to a greater extent than increasing the mass of materialized labor.

Therefore, using different methods of quality management, personnel, production, capital, energy and other resources in the enterprise can significantly save money and increase productivity.

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